CLAIMS

What is Claimed Is:

1. A signal cancellation method comprising the steps of splitting an input signal into a first and second signal, and splitting said second signal into mutually orthogonal first and second subsignals and recombining said first and second subsignals after respective amplitudes thereof have been adjusted, forming a third signal, and canceling said first signal by the third signal thereby obtained.

2. A signal cancellation method comprising the steps of splitting an input signal into a first and second signal splitting said second signal into first and second subsignals of same phase, orthogonally recombining said first and second subsignals after respective amplitudes thereof have been adjusted, forming a third signal, and canceling said first signal by the third signal thereby obtained.

3. The signal cancellation method according to claim 1, wherein at least one of said first and second subsignals is split into third and fourth subsignals of mutually opposite phases, said fourth subsignal is delayed, and after the amplitude of said third subsignal has been adjusted, it is recombined with said fourth subsignal after said delay.

4. The signal cancellation method according to claim 1, wherein at least one of said first and second subsignals is split into third and fourth subsignals of the same phase, said fourth subsignal is delayed, and after the amplitude of said third subsignal has been adjusted, said third subsignal is recombined in antiphase with said fourth subsignal after said delay.

5. The signal cancellation method according to claim 1, wherein said second signal is split into mutually orthogonal first and second subsignals and a third subsignal having a freely selected phase in the opposite quadrant as said first and second subsignals and third subsignal is delayed, and after the amplitudes of said first and second subsignals have been adjusted, said first and second subsignals are recombined in antiphase with said third subsignal after said delay.

6. The signal cancellation method according to claim 1, wherein said second signal is split into mutually in-phase first, second and third subsignals, and third subsignal is delayed, said first and second subsignals after amplitude adjustment are combined in mutually orthogonal phase and said third subsignal after said delay is combined in a freely selected phase in the quadrant opposite the first and second subsignals.

7. The signal cancellation method according to claim 1, wherein a first adjustment process, whereby the amplitude of the first subsignal is adjusted and the amplitude of the output signal at this time is minimized or reduced, and a second adjustment process, whereby the amplitude of the second subsignal is adjusted and the amplitude of the output signal at this time is minimized or reduced, are alternately performed in repetition.

8. The signal cancellation method according to claim 2, wherein at least one of said first and second subsignals is split into third and fourth subsignals of mutually opposite phases, said fourth subsignal is delayed, and after the amplitude of said third subsignal has been adjusted, it is recombined with said fourth subsignal after said delay.

9. The signal cancellation method according to claim 2, wherein at least one of said first and second subsignals is split into third and fourth subsignals of the same phase, said fourth subsignal is delayed, and after the amplitude of said third subsignal has been adjusted, said third subsignal is recombined in antiphase with said fourth subsignal after said delay.

10. The signal cancellation method according to claim 2, wherein said second subsignals is split into mutually orthogonal first and second subsignals and a third subsignal having a freely selected phase in the opposite quadrant as said first and second subsignals, said third subsignal is delayed and after the amplitudes of said first and second subsignals have been adjusted, said first and second subsignals are recombined in antiphase with said third subsignal after said delay.

11. The signal cancellation method according to claim 2, wherein said second signals is split into mutually in-phase first, second and third subsignals, said third subsignal is delayed, and first and second subsignals after amplitude adjustment are recombined in mutual orthogonal phase and said third subsignal after said delay is combined in a freely selected phase in the quadrant opposite the first and second subsignals.

12. The signal cancellation method according to claim 2, wherein a first adjustment process, whereby the amplitude of the first subsignal is adjusted and the amplitude of the output signal at this time is minimized or reduced, and a second adjustment process, whereby the amplitude of the second subsignal is adjusted and the amplitude of the output signal at this time is minimized or reduced, are alternately performed in repetition.

13. A signal cancellation device, which adjusts the phase and amplitude components of one signal formed by the splitting of an input signal so as to be the antiphase of the other signal, and cancels the input signal component by recombining these signals,

the signal cancellation device characterized as comprising:

an orthogonal splitter, which splits one of said signals into first and second subsignals which are mutually orthogonal;

first and second amplitude adjusters, which are able to adjust the amplitudes of the first and second subsignals; and

an in-phase combiner, which combines in-phase said first and second subsignals which have undergone amplitude adjustment.

14. A signal cancellation device, which adjusts the phase and amplitude components of one signal formed by the splitting of an input signal so as to be the antiphase of the other signal, and cancels the input signal component by recombining these signals,

the signal cancellation device characterized as comprising:

an in-phase splitter, which splits one of said signals into first and second subsignals having the same phase;

first and second amplitude adjusters, which are able to adjust the amplitudes of the first and second subsignals; and

an orthogonal combiner, which orthogonally combines said first and second subsignals which have undergone amplitude adjustment.

15. The signal cancellation device according to claim 13, wherein at least one of said first and second amplitude adjuster is able to reverse its output signal in positive phase or reverse phase.

16. The signal cancellation device according to claim 13, wherein at least one of said first and second amplitude adjuster comprises:

an anti-phase splitter, which splits input subsignals into third and fourth subsignals of opposite phases;

a delay device, which delays said fourth subsignal;

an amplitude adjuster, which is able to adjust the amplitude of said third subsignal in a single phase; and

an in-phase combiner, which combines in the same phase said third subsignal after amplitude adjustment and said fourth subsignal after delay.

17. The signal cancellation device according to claim 16, wherein said orthogonal splitter, which splits the split signal into mutually orthogonal first and second subsignals, and said anti-phase splitter, which splits subsignals of the input into third and fourth subsignals having mutually opposite phases, are formed by a common multi-phase splitter.

18. The signal cancellation device according to claim 13, wherein at least one of said first and second amplitude adjuster are/is provided with:

an in-phase splitter, which splits input subsignals into third and fourth subsignals of the same phase,

a delay device, which delays said fourth subsignal,

an amplitude adjuster, which is able to adjust the amplitude of said third subsignal in a single phase,

and an anti-phase combiner, which combines in opposite phases said third subsignal after amplitude adjustment, and said fourth subsignal after delay..

19. The signal cancellation device according to claim 18, wherein said orthogonal combiner, which orthogonally combines said first and second subsignals after amplitude adjustment, and said anti-phase combiner, which combines said third subsignal after amplitude adjustment and said fourth subsignal after delay in opposite phases, are formed by a common multi-phase combiner.

20. The signal cancellation device according to claim 13, wherein at least one of said first and second amplitude adjuster comprises:

a splitter, which splits the input signals into mutually orthogonal first and second subsignals and a third subsignal, which has a freely selected phase and is in the opposite quadrant of said first and second subsignals;

a delay device, which delays said third subsignal;

third and fourth amplitude adjusters, which are able to adjust the amplitudes of said first and second subsignals each in a single phase; and

an in-phase combiner, which combines in the same phase said first and second subsignals after amplitude adjustment and said third subsignal after delay.

21. The signal cancellation device according to claim 13, wherein at least one of said first and second amplitude adjuster comprises:

a splitter, which splits the input signals into first, second and third subsignals having the same phase;

a delay device, which delays said third subsignal;

third and fourth amplitude adjusters, which are able to adjust the amplitudes of said first and second subsignals each in a single phase; and

a combiner, which combines said first and second subsignals in the same phase after amplitude adjustment and said third subsignal after delay in a freely selected phase in the opposite quadrant as said first and second subsignals.

22. The signal cancellation device according to claim 13, and further comprising an automatic controller, which alternately and repetitively performs a first adjustment process, whereby the amplitude of the output signal at this time is minimized or reduced by controlling a first amplitude adjuster, and a second adjustment process, whereby the amplitude of the output signal at this time is minimized or reduced by controlling a second amplitude adjuster, are alternately performed in repetition.

23. The signal cancellation device according to claim 14, wherein at least one of said first and second amplitude adjuster is able to reverse its output signal in positive phase or reverse phase.

24. The signal cancellation device according to claim 14, wherein at least one of said first and second amplitude adjuster comprises;

an anti-phase splitter, which splits input subsignals into third and fourth subsignals of opposite phases;

a delay device, which delays said fourth subsignal;

an amplitude adjuster, which is able to adjust the amplitude of said third subsignal in a single phase; and

an in-phase combiner, which combines in opposite phases said third subsignal after amplitude adjustment and said fourth subsignal after delay

25. The signal cancellation device according to claim 14, wherein at least one of said first and second amplitude adjuster are/is provided with:

an in-phase splitter, which splits input subsignals into third and fourth subsignals of the same phase;

a delay device, which delays said fourth subsignal;

an amplitude adjuster, which is able to adjust the amplitude of said third subsignal in a single phase; and

an anti-phase combiner, which combines in opposite phases said third subsignal after amplitude adjustment and said fourth subsignal after delay.

26. The signal cancellation device according to claim 14, wherein at least one of said

first and second amplitude adjuster comprises:

a splitter, which splits the input signals into mutually orthogonal first and second subsignals and a third subsignal, which has a freely selected phase and is in the opposite quadrant of said first and second subsignals;

a delay device, which delays said third subsignal;

third and fourth amplitude adjusters, which are able to adjust the amplitudes of said first and second subsignals each in a single phase; and

an in-phase combiner, which combines the same phase said first and second subsignals after amplitude adjustment and said third subsignal after delay.

27. The signal cancellation device according to claim 14, wherein at least one of said first and second amplitude adjuster comprises:

a splitter, which splits the input signals into first, second and a third subsignals having the same phase;

a delay device, which delays said third subsignal;

third and fourth amplitude adjusters, which are able to adjust the amplitudes of said first and second subsignals each in a single phase; and

a combiner, which combines said first and second subsignals in the same phase after amplitude after adjustment and said third subsignal after delay in a freely selected phase in the opposite quadrant as said first and second subsignals.

28. The signal cancellation device according to claim 14, and further comprising an automatic controller, which alternately and repetitively performs a first adjustment process, whereby the amplitude of the output signal at this time is minimized or reduced by controlling a first amplitude adjuster, and a second adjustment process, whereby the amplitude of the output signal at this time is minimized or reduced by controlling a second amplitude adjuster, are alternately performed in repetition.

29. A feed-forward amplifier comprising a signal cancellation device in one of a pre-stage distortion extraction loop and a post-stage distortion loop, said signal cancellation device including:

an orthogonal splitter, which splits one of said signals into first and second subsignals which are mutually orthogonal;

first and second amplitude adjusters, which are able to adjust the amplitudes of the first and second subsignals; and

an in-phase combiner, which combines in-phase said first and second subsignals which have undergone amplitude adjustment.

30. A feed-forward amplifier comprising a signal cancellation device in one of pre-stage distortion extraction loop and a post-stage distortion loop, said signal cancellation device including:

an in-phase splitter, which splits one of said signals into first and second subsignals having the same phase;

first and second amplitude adjusters, which are able to adjust the amplitudes of the first and second subsignals; and

an orthogonal combiner, which orthogonally combines said first and second subsignals which have undergone amplitude adjustment.

31. The feed-forward amplifier according to claim 29, and further comprising a next-stage splitter, which splits a portion of the output of the pre-stage amplifier, and a pre-stage combiner, which synthesizes said split signals and the delay signals of the pre-stage.

32. The feed-forward amplifier according to claim 30, and further comprising a next-stage splitter, which splits a portion of the output of the pre-stage amplifier, and a pre-stage combiner, which synthesizes said split signals and the delay signals of the pre-stage.